



M.Sc. II Semester Degree Examination, September/October - 2022

CHEMISTRY

21CHE2C6L : Reaction Mechanisms in Organic Synthesis and Pericyclic Reactions

Time : 3 Hours

Maximum Marks : 70

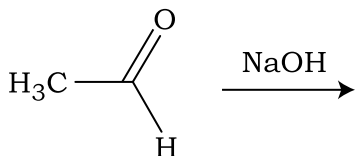
Note : Answer **any five** of the following questions with question no. **1** is **compulsory**, each question carries **equal** marks.

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|----|------|--|---|
| 1. | (a) | Explain the types of Organic reactions with example. | 4 |
| | (b) | Draw and give the importance of potential energy diagram. | 5 |
| | (c) | What is Curtin-Hammet Principle ? Explain with example. | 5 |
| 2. | (a) | Explain mechanistic aspects of addition reaction. | 4 |
| | (b) | Describe the Sharpless asymmetric epoxidation reaction with mechanism using nucleophiles. | 5 |
| | (c) | Give an account of stereochemical aspects of Addition reaction. | 5 |
| 3. | (a) | Predict the product in the following reactions and suggest a suitable mechanism. | 5 |
| | | $\text{H}_3\text{C}-\overset{\text{O}}{\parallel}-\text{OC}_2\text{H}_5 \xrightarrow{\text{C}_2\text{H}_5\text{ONa}}$ | |
| | (b) | Predict the product and mechanism for the following reaction. | 5 |
| | | $\text{C}_6\text{H}_5-\overset{\text{O}}{\parallel}-\text{CH}_3 + \text{H}-\overset{\text{O}}{\parallel}-\text{H} + \text{H}_3\text{C}-\text{N}(\text{H})-\text{H}_3 \cdot \text{HCl} \longrightarrow$ | |
| | (c) | Explain metal hydride reduction with suitable examples. | 4 |
| 4. | (a) | List out the uses of following reagents in organic synthesis. | 5 |
| | (i) | Dicyclohexylcarbodiimide (DCC) | |
| | (ii) | Merrifield Resin | |
| | (b) | Write a note on Phase transfer catalysts. | 4 |
| | (c) | Explain the applications of Dess-Martin Periodinane (DMP) with example. | 5 |



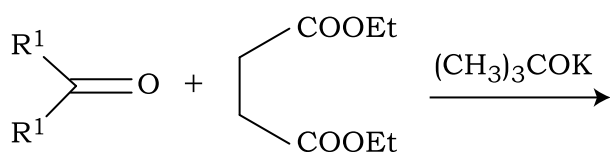
5. (a) With a suitable example, explain [3, 3] and [5, 5] sigmatropic rearrangements. **5**
 (b) “[2+2] cyclo addition of alkenes is photochemically allowed and thermally forbidden process”. Justify this statement using FMO approach. **4**
 (c) Explain the following with example : **5**
 (i) Suprafacial addition
 (ii) Antrafacial addition

6. (a) Explain various methods of hydrogenation of carbon-carbon double bonds and triple bonds. **5**
 (b) Outline the reduction reactions of : **5**
 (i) Nitriles
 (ii) Esters
 (iii) Acids
 (c) Complete the following reaction and give its mechanism. **4**



7. (a) Give any four uses of DDQ. **4**
 (b) Write a note on following : **5**
 (i) Wilkinson catalyst
 (ii) Ziegler - Natta catalyst
 (c) Explain Woodward - Hoffmann diagram. **5**

8. (a) Predict the product in the following reaction and give its mechanism. **4**



- (b) Write a note on : **5**
 (i) Crown ethers,
 (ii) Woodward Prevost hydroxylation
 (c) State and explain the cope rearrangement reaction with its mechanism. **5**

